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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,198	12/05/2003	Robert Draper	2003P17845US	2429

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Siemens Corporation  
Intellectual Property Department  
170 Wood Avenue South  
Iselin, NJ 08830

EXAMINER
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THOMPSON, MELISSA

ART UNIT	PAPER NUMBER
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1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/21/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/729,198	<b>Applicant(s)</b> DRAPER ET AL.	
	<b>Examiner</b> Melissa B. Thompson	<b>Art Unit</b> 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/05/2003</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Oath/Declaration***

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:  
It does not identify the citizenship of each inventor.

### ***Specification***

2. The disclosure is objected to because of the following informalities: Page 2, line 1, the word "feel" should be the word "feed". Page 2, line 26, there should be a comma after the words steels and plastics. Page 6, line 13, the word "is" should be removed. Page 8, line 16, the "l" should be the word "In". Page 9, line 13, the number 16 should be 26. Page 10, line 15 the word "be" should be the word "by". Page 10, line 18 the word "is" should be the word "its". Page 12, line 7, the letter "T" is missing from the word "The". Page 13, line 21 the letter "o" is missing from the word "hot".

Appropriate correction is required.

### ***Claim Objections***

3. Claim 14 is objected to because of the following informalities: "diverter value" should be "diverter valve". Appropriate correction is required.
4. Claim 15 is objected to because of the following informalities: the grammar is awkward. The word "here" should be replaced with the word "wherein". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 2, 5, 10, 16 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 16 and 17 depend from claim 13, which is not a method claim. For the purposes of compact prosecution, claims 16 and 17 are interpreted to be dependent from claim 15.

The term "low temperature materials" in claim 2,5, and 10 is a relative term which renders the claim indefinite. The term "low temperature materials" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-6 and 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Holmes et al. (U.S. Publication Number 2002/0110716 A1).

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Holmes et al. disclose a solid oxide fuel cell (SOFC) generator that contains fuel cells (abstract). Holmes et al. show a housing (Figure 2) that includes a bottom fuel inlet plenum (11), a single oxidant inlet plenum (52), a reaction chamber, and a reacted oxidant/fuel exhaust or combustion chamber (94) (paragraphs 15 and 16). The air feed is located at the top of Figure 2, while the fuel inlet, although not seen, is inherently located at the bottom close to the fuel inlet plenum. The reaction chamber containing the fuel cells is located in the center of Figure 2. The combustion chamber is located directly above the recirculation chamber (106). The exhaust chamber (94) is directly below the oxidant inlet plenum, which is used to heat the incoming feed oxidant (paragraph 16). The exhaust or combustion chamber is considered to be the interior heat exchanger zone because this is the area where the incoming air is heated in the feed tubes. The oxidant inlet plenum is surrounded by insulation, most of it in bulk ceramic fiber form (paragraph 17), making the plenum made out of low temperature materials.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over Holmes et al. (U.S. Publication Number 2002/0110716 A1) in view of Fischer et al. (U.S. Patent Number 3,718,506).

Holmes et al. teach a solid oxide fuel cell (SOFC) generator that contains fuel cells in a housing (abstract). Holmes et al. teach that each fuel cell has an open top end (37) and a closed bottom end (38) as seen in Figure 2. Each fuel cell has an interior self-supporting air electrode, an exterior fuel electrode, and a solid electrolyte (paragraph 15). Holmes et al. teach that the oxidant inlet plenum is surrounded by insulation, most of it in bulk ceramic fiber form (paragraph 17), making the plenum made out of low temperature materials. The exhaust chamber (94) is directly below the oxidant inlet plenum, which is used to heat the incoming feed oxidant (paragraph 16). The exhaust or combustion chamber is considered to be the interior heat exchanger zone because this is the area where the incoming air is heated in the feed tubes.

Holmes et al. do not teach a pump for pumping air into the air entry plenum.

Fischer et al. teach a high temperature fuel cell system that has a generator inside a housing (Figure 1), with a fuel inlet (1) and an air inlet (8). Fischer et al. teach using a pump (P) to bring air into the generator to be heated on the inside in the heat exchanger section (2b).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the pump of Fisher et al. in the SOFC generator of

Holmes et al. The pump flows air into the generator at a constant rate and causes a steadier stream of air to be introduced to the generator. Therefore, including the pump in the generator of Holmes et al. would bring in a steadier stream of air.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes et al. (U.S. Publication Number 2002/0110716 A1) in view of WO 02/54519 (equivalent document to Akikusa et al. (U.S. Publication Number 2003/0134174 A1), relied upon for translation).

The disclosure of Holmes et al. as applied to claim 4 discussed above is incorporated herein.

Holmes et al. do not teach an internal heater panel surrounding the electrochemical reaction chamber.

Akikusa et al. teach a solid oxide fuel cell module (paragraph 1). The fuel cell module includes an air and fuel inlets with fuel cells that are contained within a reaction chamber, which is interpreted as the area where the fuel cells react. Akikusa et al. teach the fuel cells surrounded by a heater in the reaction chamber (32 in Figure 1 and paragraph 39).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the heater around the fuel cells in the reaction chamber of Akikusa et al. in the SOFC generator of Holmes et al. By including the heater the fuel and oxidant are heated prior to use allowing the temperature of the fuel

cell more suitable for power generation and the power generation efficiency is further improved (paragraph 40).

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes et al. (U.S. Publication Number 2002/0110716 A1) in view of Draper et al. (U.S. Patent Number 4,664,986).

The disclosure of Holmes et al. as applied to claim 4 discussed above is incorporated herein.

Holmes et al. do not teach an air feed tubes with metallic conducting inserts.

Draper et al. teach a fuel cell generator containing fuel cells, a fuel inlet, and an oxidant inlet (abstract). The air feed conduits (Figure 6), contain an extending, exterior metal alloy straight or helical finned (column 6, line 65 to column 7, line 1).

It would have been to one of ordinary skill in the art at the time of the invention to include the metal alloy inserts of Draper et al. in the SOFC generator of Holmes et al. The inserts improve heat transfer, even more, and made the conduit self-centering within the fuel cell (column 7, lines 2-4).

13. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes et al. (U.S. Publication Number 2002/0110716 A1) and Fischer et al. (U.S. Patent Number 3,718,506) as applied to claim 9 above and further in view of WO 02/54519 (equivalent document to Akikusa et al. (U.S. Publication Number 2003/0134174 A1), relied upon for translation).



The disclosure of Holmes et al. and Fischer et al. as applied to claim 9 discussed above is incorporated herein.

Holmes et al. and Fischer et al. do not teach an internal heater panel surrounding the electrochemical reaction chamber.

Akikusa et al. teach a solid oxide fuel cell module (paragraph 1). The fuel cell module includes an air and fuel inlets with fuel cells that are contained within a reaction chamber, which is interpreted as the area where the fuel cells react. Akikusa et al. teach the fuel cells surrounded by a heater in the reaction chamber (32 in Figure 1 and paragraph 39).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the heater around the fuel cells in the reaction chamber of Akikusa et al. in the SOFC generator of Holmes et al. and Fischer et al. By including the heater the fuel and oxidant are heated prior to use allowing the temperature of the fuel cell more suitable for power generation and the power generation efficiency is further improved (paragraph 40).

14. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes et al. (U.S. Publication Number 2002/0110716 A1) and Fischer et al. (U.S. Patent Number 3,718,506) in view of Draper et al. (U.S. Patent Number 4,664,986).

The disclosure of Holmes et al and Fischer et al. as applied to claim 9 discussed above is incorporated herein.

Holmes et al. and Fischer et al. do not teach an air feed tubes with metallic conducting inserts.

Draper et al. teach a fuel cell generator containing fuel cells, a fuel inlet, and an oxidant inlet (abstract). The air feed conduits (Figure 6), contain an extending, exterior metal alloy straight or helical finned (column 6, line 65 to column 7, line 1).

It would have been to one of ordinary skill in the art at the time of the invention to include the metal alloy inserts of Draper et al. in the SOFC generator of Holmes et al and Fischer et al. The inserts improve heat transfer, even more, and made the conduit self-centering within the fuel cell (column 7, lines 2-4).

15. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes et al. (U.S. Publication Number 2002/0110716 A1) in view of Fischer et al. (U.S. Patent Number 3,718,506) as applied to claim 9 above, and further in view of Gardener et al. (US Patent Number 5,486,428).

The disclosure of Holmes et al. and Fischer et al. as applied to claim 9 discussed above is incorporated herein.

Holmes et al. as modified by Fischer et al. do not teach a diverter valve.

Gardener et al. teach a solid oxide fuel cell stack with an air supply pipe (76) seen in Figure 1. The air supply pipe has a valve (78).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the valve of Gardener et al. in the air supply pipe of Holmes et al. as modified by Fischer et al. Including a valve on the air supply pipe enables controls of the flow of air (col. 7, lines 39-40) into the SOFC generator and allows for optimization of the flow of air into the SOFC.


**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa B. Thompson whose telephone number is (571) 272-2758. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Trainer, Susy Tsang-Foster can be reached on (571) 272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MBT

  
SUSY TSANG-FOSTER  
PRIMARY EXAMINER